EFFECT OF MOBILE MONEY PAYMENTS ON FINANCIAL DEEPENING IN KENYA

BY

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D61/79331/2012

A RESEARCH PROJECT PRESENTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER BUSINESS ADMNISTRATION, UNIVERSITY OF NAIROBI

OCTOBER 2014

DECLARATION

I declare that this research project is my own original work and to my best of my knowledge it has not been submitted for a degree award in any other University or institution of higher learning.

Signature…….. Date ……..

Denis Ochenge Binyanya

D61/79331/2012

This project has been presented for examination with my approval as the university supervisor.

Supervisor

Signature…….. Date ……..

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DEDICATION

To my beloved wife Martha Momanyi, your love and care has been invaluable and to sweet baby Beatrice that you may excel beyond this.

ACKNOWLEDGEMENT

I am grateful to the Almighty God for all His graces and mercies. He gave me strength, courage and good health to undertake this MBA course.

I would like to thank all my friends; Enock Omwenga, Richard Nyatangi, Jeremiah Okari, Isaac Maonga and Dominic Simba. I am grateful for their moral and spiritual support. I also thank to my cousin Dennis Marube for his constant inspiration and advice.

Finally, I thank my supervisor Joseph Barasa for giving me guidance and being there for me as I was working through the project. He challenged me to be thorough in whatever I did. To you all; thank you so much and may God bless you abundantly.

ABSTRACT

The main purpose of this study was to establish the effect of mobile money payments on financial deepening in Kenya. The study adopted a descriptive survey research design. It made use of secondary data that was collected from Central Bank of Kenya, Kenya National Bureau of Statistics and Communications Authority of Kenya for a period of ten years from 2004 to 2013. Regression analysis was used to establish the effect of mobile money payments on financial deepening in Kenya. The study revealed that mobile money payments have a significant relationship with financial deepening in Kenya. However, the study results indicate that mobile deposits have a negative relationship with financial deepening and the study recommends further research to be done on why mobile deposits have a negative relationship with financial deepening.

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ABBREVIATIONS

ANOVA- Analysis of Variance

ATM- Automatic Teller Machine

CBK- Central Bank of Kenya

CCK- Communications Commission of Kenya

FSD- Financial Sector Deepening

GSM- Global System of Mobile communication

MFS- Mobile Financial Service

MMT- Mobile Money Transfer

ROSCAS- Rotating Savings and Credit Associations

SACCO- Savings and Credit Cooperatives

SPSS- Statistical Package for Social Science

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The greatest opportunity to make progress on financial inclusion in developing and emerging countries is provided by new technology channels, in particular mobile technology. Globally, out of 2.5 billion people who are still denied access to the financial system, there are 1.7 billion people who have mobile phones. These people can use mobile phones for remote communication, but still have to store and transfer value through tangible assets. Mobile money is the most cost-effective way to extend the reach of formal financial services, nonetheless its potential to achieve financial inclusion is yet to be realized. Yet access to financial services is a key aspect of development, as credit and savings allow households to invest, save and respond to shocks.

Since 2005, a new technology—mobile money—has become available in over eighty countries worldwide. Mobile money (m-money) is a product that allows clients to use text messages to store value in an account accessible by the handset, convert cash in and out of the stored value account, and transfer value between users (Aker and Mbiti 2010). As compared with the traditional means of sending and receiving money within many developing countries, such as Western Union and MoneyGram, the postal service or delivery by friends or family, m-money substantially reduces the costs of transferring money (Jack and Suri 2012).

According to Fin Access Report (2013), 66.7% of adults accessed financial services from any type of formal financial provider in 2013 compared to 27.4% in 2006 and 41.3% in 2009. The

proportion of the financially excluded on the other hand has been falling steadily from 39.3% in 2006 to 31.4% in 2009 and now stands at 25.4% of the adult population

1.1.1 Mobile Money Payments

According to the Global System for Mobile Communications (GSM) Association study on Mobile Money Transfer (MMT), Mobile money transfer is the process of transmitting money from one person to another through phone activation that can be ultimately honored with cash transactions by a financial or business institution (Agrawal, 2009). These are the services that connect subscribers financially through the mobile phone. This allows the respective network subscribers whether banked or unbanked to deposit value via simple handset to another mobile subscriber and further allow the recipients to turn that value into cash easily and cheaply. Financial services via mobile phone is one principal way on which mobile telephony is transforming the life and business in developing economies. (Gavin K & Jesse M, 2009)

The adoption of mobile phone has occurred at perhaps the fastest rate and to the deepest level of any consumer-level technology in history. (Jack W & Suri T, 2010).Safaricom (the Kenyan Vodafone affiliate) launched the maiden mobile based money transfer and payment service M-PESA that within the first three months of the commercial launch saw 111,000 subscribers registered for the service. This trend has spontaneously grown to 18.9M subscribers by March 2012 with a network of 45,861 number of agent network in the same period. Besides M-PESA, other mobile money transfer services include Airtel‘s Zap, yu cash, Orange Telkom & Equity Bank Iko Pesa and family Bank Pesa Pap service.

Mobile money transfer increases the accessibility and ease of transfer to larger population due to its simplicity in operation, convenience to operate and availability through the agency network. Mobile Money transfer is envisioned to be the solution to this financial exclusion problem since the mobile subscriber base in increasing significantly. This will also be beneficial to other formal and informal financial institutions as they will ride on the mobile money platforms to intermediate their mutual customers/ subscriber‘s. The formal financial institutions like banks, Savings and Credit Cooperative (SACCO) micro-credit and lending institutions are motivated by extra popularity, further reach by agencies and affordability of mobile money transfer services (Waihenya, 2012)

1.1.2 Financial Deepening

According to Shaw (1973), financial deepening means increasing the provision of financial services-measured by the ratio of money supply to GDP in the economy. The more liquid money is available in an economy, the more opportunities exist for continued growth. It reduces risk and vulnerability for disadvantaged groups, increasing the ability of individuals and households to access basic services e.g. health, education and other social services having a more direct impact on economic development. The range of financial assets includes broad money, liabilities of non-bank financial assets, treasury bills, insurance, value of shares and money market fund. Financial deepening is afforded by financial intermediation and liquidity in an economic system (Shaw, 1973). Financial sector deepening is supposed to lead to financial development. Financial development leads to greater investment efficiency and mobilization of greater financial resources to finance investments. Lyrels (1995) showed that development of the financial sector improves investment allocation thereby lifting economic performance.

Financial intermediaries are the vehicles for financial deepening. Financial intermediaries mediate between the providers and users of financial capital (Thakor, 2007). They borrow money from households, firms, or other financial intermediaries, and lend money to other households, firms, or other financial intermediaries. Functions of financial intermediaries therefore abound in a financial system. To produce information ex-ante about possible investments, and to provide a better allocation of capital, financial intermediary development can improve productivity by this channel, as banks may reduce the costs of the evaluation of investment projects before the lending decision, and therefore allow a better allocation of capital (Boyd and Prescott, 1986); To monitor firms and to exert corporate governance; foster the trade, diversification and management of risk; Pool savings - financial intermediaries can then help improve firms‟ productivity, by reducing the transaction costs associated with the mobilization of savings from different economic agents and by reducing information costs for the savers. Therefore, this reduction of costs makes financial intermediaries useful to improve resource allocation, and also favor technological innovation; easing of the exchange of goods and services.

1.1.3 Mobile Money Transfer and Financial Deepening

Mobile money transfer is a potential tool to overcome the financial infrastructure gap. Branchless banking services such as mobile financial services are becoming increasingly popular in a number of African countries. Mobile money can spur economic growth as it directly or indirectly contributes to output growth and unemployment creation, improve firm productivity, generate network and economic externalities, favour better market functioning, reduce transaction costs, and more importantly encourage deeper financial inclusion (Andrianaivo & Kpodar, 2012).

The revolution is mobile money transfer where mobile subscriber‘s use of mobile phones to make financial transactions has been sprouting across the world at a remarkable speed. The continued acceptance of the mobile money transfer services has added impetus towards financial accessibility by non-banked population. Traditional banking methods have limited reach to people especially in rural areas as bank branches are located mainly in the highly populates area, high transactional costs and complex accounts opening and maintenance has contributed to lower financial inclusion and deepening in most developing economies.

Mobile money transfer increases the accessibility and ease of transfer to larger population due to its simplicity in operation, convenience to operate and availability through the agency network. Mobile Money transfer is envisioned to be the solution to this financial exclusion problem since the mobile subscriber base in increasing significantly. This will also be beneficial to other formal and informal financial institutions as they will ride on the mobile money platforms to intermediate their mutual customers and subscriber‘s.

1.1.4 Mobile Money Transfer and Financial Deepening in Kenya

During the quarter ended March 31, 2014, the sector comprised 43 commercial banks, 1 mortgage finance company, 9 microfinance banks, 7 representative offices of foreign banks, 97 foreign exchange bureaus, 3 money remittance providers and 2 credit reference bureaus. The Kenyan Banking Sector registered enhanced performance with the size of net assets standing at Ksh. 2.8 trillion, loans & advances worth Ksh. 1.7 trillion, while the deposit base was Ksh. 2.0 trillion and profit before tax of Ksh. 33.4 billion as at 31st March 2014. Over the same period, the number of bank customer deposit and loan accounts stood at 23,816,147 and 3,463,900 respectively. (CCK Quarterly Report, 2014).

Kenya's banking sector moved towards greater inclusiveness, efficiency and stability in 2013 as envisaged in Kenya's Vision 2030. Key developments in the sector during the year included the following: Increased convergence of banking and mobile phone platforms as banks explored more convenient and cost effective channels of banking; reduction in the level of financially excluded Kenyans from 33% in 2009 to 25% in 2013, the proportion of Kenyans with access to formal financial services increased to 67% in 2013 from 41% in 2009. (CBK Report 2013)

Mobile technology has continued to revolutionize payment systems in Kenya, with the provision of applications that enable diverse financial transactions via the mobile platform. These applications included purchasing airtime, money transfer, paying bills, Automated Teller Machine (ATM) withdrawals and even facilitating mobile banking transactions such as sending or withdrawing money to and from ones' bank account, via the various mobile money transfer platforms offered by the operators. The 'mobile wallet' enables money transfer payments to schools, hospitals and other organizations as well as enabling shopping both online and from local retail outlets.

According to Baraka et al, (2013) the role of telecommunication technology and in particular mobile phone use in provision of financial service is certain. Inclusive financial sector is therefore analogous to financial deepening. As documented in Imboden (2005), there is convincing evidence that there is positive link between financial deepening and growth. According to Central Bank of Kenya Governor, through mobile phone financial services, banks can provide convenience and efficiency to customers, which has contributed to the increase in the number of bank deposit and loan accounts from 6.9 million and 1.2 million, respectively, in 2007 to 16.7 million and 2.1 million, respectively, as of September 2012.

1.2 Research Problem

As mobile phone adoption is increasing, so too are the financial services available to consumers through a mobile channel. MFS features now exist that enable consumers to meet many day-to-day transaction needs using a mobile phone, including monitoring account balances, paying bills, and depositing checks. In addition, mobile technology enables consumers to conduct these transactions more conveniently and quickly than through other channels. Also, banks' ongoing operational costs associated with MFS are frequently lower than for other channels, and Mobile Financial Services (MFS) can increase the engagement and longevity of customer relationships and yield more profitable customers.

Studies done locally include; Fawzia, A (2009) studied the impact of mobile technology on mobile money transfers in Nairobi. She found out that the growth in the mobile usage in Kenya with the penetration rate of 45% of the total country base in 2009 represented an opportunity for the mobile service providers to partner with the financial institutions for possible financial products. The study further identifies basic attempts that the mobile money transfer services have put in place in reduction of inefficiencies, inexistent and unmet demands of the current financial landscape in Kenya.

Munyi (2011) in his research on responses by commercial banks to the introduction of mobile money transfer notes that there has been notable improvement in the innovation and solution development in both telecommunications & financial institutional set ups both geared towards ensuring that there is improved availability of money when needed conveniently and at low transactional costs. The study indicates that since 2007 there has been unexpected competition to commercial banks products from the instruction, rapid evolution & run-away success on mobile

money transfer services leading to increased access and availability to financial ability at the convenience of the GSM handset.

Several studies analyzed the case of M-PESA in Kenya. Mbiti and Weil (2010) identify increased frequency and overall volume of urban-rural money transfers as the main driving force behind the success of M-PESA. They also emphasize that M-PESA is frequently used as a storage-savings device for safety considerations. Jack and Suri (2011) describe the M-PESA experience in detail and raise a number of interesting potential economic effects and underlying mechanisms of mobile money. At the household these could range from impacts on saving and investment, to risk spreading and insurance. Mas and Morawczynski (2009) highlight appropriate liquidity management of rural agents (i.e., their ability to meet customer requests for cash withdrawals), and transparent pricing as crucial attributes of a successful mobile money product

With the rapid growth of the mobile phone usage at penetration level of 78.0% 30.7 million subscribers, CCK Quarterly Sector Statistics Report (2013). The above studies did not critically demonstrate the relationship of the experiences and accepted Mobile money transfer and financial inclusion in the economy. Mobile Money Transfer is therefore becoming one of the main focus in the arena of financial value transfer and integration in the Kenyan economy. Institutions including banks, micro finance institutions, and utility service providers are further aligning their product & technological investments base towards incorporating Mobile Money Transfer services in an effort to lock in increased users. This study therefore seeks to answer the following research question; what is the effect of mobile payments on financial deepening in Kenya

1.3 Objective of the Study

To establish the effect of mobile money payments on financial deepening in Kenya

1.4 Value of the Study

The study will be of great importance to the financial sector as it will demonstrate the effect of mobile money payments to financial deepening. The study will highlight the potential influence of adopting mobile payments to reach the unbanked and offer diversified and competitive products with minimal cost and risks.

The study will benefit the government and regulators with the understanding of importance of proper and supportive regulatory framework, legislations and additional control procedures needed in the mobile money industry towards operational and systemic risks that may arise from the use of the new technology in banking.

The findings of this study will be beneficial towards enhancing the knowledge on mobile money payments and financial deepening. It will also assist in confirming or giving any contrary evidence to the theoretical foundations of mobile payments and financial deepening. It will also point out areas for further research that will serve as foundations for future research activity on mobile money payments and financial deepening.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter starts by reviewing the theories on financial deepening and in particular, Shaw's financial deepening hypothesis, financial intermediation theory and Innovation theory are reviewed. Empirical literature review will consider a number of studies that have been done both locally and international to establish the relationship between financial deepening and mobile money developments. The chapter ends with a summary of the literature reviews.

2.2 Theoretical Literature Review

2.2.1 Shaw's Financial Liberalization Hypothesis

According to Shaw (1973) financial deepening hypothesis, financial liberalization tends to raise ratio of private domestic savings to income. With real growth of financial institutions, there are many investors having access to borrowing. There arises incentives for saving with many players and borrowings become cheaper. Savings also tend to rise in the Government sector. With financial deepening, savings from the foreign sector respond to financial liberalization. There is inflow of capital and easy access to foreign capital markets, which remove distortions in relative prices.

Shaw (1973) focused on the benefits of an efficient and well-functioning financial system. His intermediation view suggests that financial intermediaries promote investment and raise output growth through the intermediation process. Shaw argues that higher deposit rates will increase

financial savings and expand the role of financial institutions in channeling funds from surplus to deficit units in the economy. The development of the financial system will create the incentive to save, which will raise the volume and efficiency of investment and thus accelerate economic growth.

Shaw's model of developing countries is based on two important assumptions. Firstly, investors in a typical developing economy have limited opportunities for external finance and are thus confined to self-finance. Secondly, investment expenditures are lumpier than consumption expenditure and potential investors must first accumulate money balances prior to undertaking relatively expensive and indivisible investment projects.

In the early 1980s, the neo-structuralists provided an alternative view of the effect of financial liberalization, which criticized the McKinnon-Shaw paradigm for not incorporating the informal financial markets in their framework. The neo-structuralists school, led by Wijnbergen (1983) and Taylor (1983), postulates that financial liberalization may not result in increased output growth in situations of efficient curb markets. In particular, Wijnbergen (1983) argues that financial liberalization is likely to reduce the rate of economic growth by reducing the total real supply of credit available to investors due to the effects on the curb market.

Therefore, liberalization permits the financial process of mobilizing and allocating savings to displace inflation and foreign aid. Liberalization enables superior allocation of savings through widening and diversifying financial markets wherein investment opportunities compete for savings flow. The savers are offered a wider menu of portfolio choice. Information is available more cheaply. Local capital markets are integrated and new avenues for pooling savings and

specializing in investments are possible. Prices are used to discriminate between investment opportunities.

Shaw framework is important to this study in the sense that it advocates for the implementation of financial liberalization policies as a way of increasing financial savings mobilization, improving efficiency with which resources are allocated among alternative investment projects and therefore enhancing economic growth. This is what mobile money payments is all about

2.2.2 Financial Intermediation Theory

The theory regarding financial intermediation was developed starting with the 60's in the 20 century, the starting point being the work of Gurley and Shaw (1960). The financial intermediation theory is based on the theory of informational asymmetry and the agency theory. In principle, the existence of financial intermediaries is explained by the existence of the following categories of factors: high cost of transaction, lack of complete information in useful time; and the method of regulation.

The main and most used factor in the studies regarding financial intermediation is constituted by the argument regarding informational asymmetry. This asymmetry can be of type: ex ante generating the so called problem of adverse selection; concomitant generating the moral hazard; or ex post leading to the need of applying some costly verification and auditing procedures or even the forced execution of the debtor. The informational asymmetry generates imperfections of the market, deviations from the theory of perfect markets.

According to the model of perfect financial markets in the neo -classical theory, they fulfill the following conditions: no one participant can influence the prices; the placement/borrowing

conditions are identical for all participants; there are no discriminatory fees; the lack of competitive advantages at the level of participants; all financial securities are homogeneous, dividable and transactional; there are no transaction costs for obtaining information or of insolvency; all participants have immediate aces to the complete information regarding the factors and elements that can influence the current or future value of the financial instruments.

Many of these imperfections generated by informational asymmetry lead to the emergence of some specific forms of transaction costs. The financial intermediaries have emerged exactly to eliminate, at least partially, these costs. For example, Diamond and Dybvig (1983) consider banks as being a coalition of the depositors that ensures those who save up against the risks that could affect their state of liquidity. Leland and Pyle (1977) define financial intermediaries as a coalition that deals with the distribution of information. Diamond (1984) shows that these financial intermediaries action as authorized agents of those who save up and that they can achieve scale economies. Thus those who save up trust their available funds to these intermediaries in order to be invested in whichever projects they consider viable, the depositors having the possibility to withdraw their funds at any time under the pre -established conditions.

The financial intermediation theory is relevant to this study as indicates how mobile money payments can solve problems regarding informational asymmetry especially the problematic of relationships between banks and creditors. In the relationship between bank and borrower the main aspect analyzed is the function of the selection bank and the tracking of the granted loans, as well as the problematic of adverse selection and moral hazard. Mobile payments also offer the technology that reduces transaction cost in addition to mobilizing deposits that are required by

banks in order to lend. The reduction in transaction cost, greater mobilization of deposits and increased lending is what collectively leads to enhanced financial deepening.

2.2.3 Diffusion of Innovation Theory

Diffusion of Innovation (DOI) Theory was developed by E.M. Rogers in 1962. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior, or product. Adoption means that a person does something differently than what they had previously (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible

The diffusion of innovation theory has therefore been effectively reviewed by Rodgers (2003). The theory seeks to explain the process through which innovation is communicated over certain duration of time among members of a particular social system. He further argues that there are four main elements that make the diffusion of technology in society possible or successful. The first element of technology diffusion is the innovation which implies the idea, practice or object that is developed and is the focus of the adoption; the second element is the time within which the technological innovation is accepted within a social system; the third element is communication channel, how the innovation is introduced or how it is marketed to an individual and the last element is a social system which refers to elements such as individuals, groups, organizations and/or subsystem that are involved in the adoption of the innovation and their

impact on each other.

The four elements outlined by Rodgers (2003) are the fundamental foundations upon which adoption of mobile technology in banking is based. Successful adoption of a particular innovation should score higher in terms of its relative advantage over existing practices, compatibility to users' needs, trial ability and observability, and lower in its complexity to use. The relative advantage of one technology over another is a key determinant of the adoption of new technology. The issue of relative advantage has been shown to have a positive relationship with adoption of innovation (Teng, Grover, & Guttler, 2002). Users need to be shown that mobile technology offers considerable benefit compared to traditional offering. The mobile phone technology has proved that it has the potential to offer more benefits in banking than the traditional or conventional banking. This is the reason why the same has been adopted by most banks around the globe.

Mobile money payments being a new way of doing financial transactions may face challenges in its rollout and acceptance to the population. The diffusion of innovations theory is relevant to this study as it offers insights on how adoption of mobile money payments influences financial deepening and how the government, the telecoms financial players and other stakeholders can enhance faster adoption of mobile payments for enhanced financial deepening.

2.3 Determinants of Financial Deepening

Dehesa (2007) in his study considers the ratio of private sector credit to GDP (Gross Domestic Product) as an indicator of financial deepening. Ang (2008) to construct a financial deepening indicator takes into account the ratio of private credit to GDP as the primary measure and the

money supply relative to GDP as an alternative measure. Ndebbio (2004), considering that financial deepening means an increase in assets and providing level of financial services to the economy.

Gries et al. (2011) in his scientific research work on the causality between financial deepening, trade openness and economic growth, build a financial deepening composite indicator using the principal component analysis. He applied this method to the ratios "Commercial banks assets relative to central bank assets", "Liquidity relative to GDP", "Private credit with the currency of bank deposits relative to GDP" and "Bank deposits relative to GDP" from the new database on financial development of Beck et al. (2000).

Financial deepening generally entails an increased ratio of money supply to Gross Domestic product (Nnanna and Dogo,1998; Nzotta, 2004). Financial deepening is thus measured by relating monetary and financial aggregates such as M1, M2 and M3 to the Gross Domestic Product (GDP).Thus, the definition of financial deepening in literature reflects the share of money supply in GDP. The most classic and practical indicator related to financial deepening is the ratio of M2/GDP which means the share or M I + all time-related deposits and non-institutional money market funds to GDP in a certain year. M1, M2, M3 are all measures or money supply, that is the amount of money in circulation at a given time. The logic here is that the more liquid money is available to an economy, the more opportunities exist for continue growth of the economy.

2.4 Empirical Literature Review

Mbithi and Weil (2011) examined how M-Pesa is used as well as its economic impacts. Analyzing data from two waves of individual data on financial access in Kenya, they found that

increased use of M-Pesa lowers the propensity of people to use informal savings mechanisms such as Rotating Savings and Credit Associations (ROSCAS), but raises the probability of their being banked. Using aggregate data, they calculated the velocity of M-Pesa at between 11.0 and 14.6 person-to-person transfers per month. The study found little evidence that people used their M-Pesa accounts as a place to store wealth, but the results suggested that M-Pesa improves individual outcomes by promoting banking and increasing transfers.

Karlan & Murdoch (2010) call for the understanding of the impact of technology on savings, as unintended consequences are possible: liquidity may carry self-control problems (as in Ashraf et al, 2006) and social pressure. Despite these concerns, Dupas and Robinson (2010) show that access to non-interest-bearing bank accounts among self-employed individuals in rural Kenya increased savings and their productive investment. Recent work by Aycinena et al. (2011) provides causal evidence on transaction costs as a determinant of remittance behavior.

Mbiti & Weil, (2011), a study on Mobile Banking: the impact of M-Pesa in Kenya. Their main focus was to examine how M-Pesa is used as well as its economic impacts. Analyzing data from two waves of individuals data on financial access in Kenya, they found that increased usage of M-pesa lowers the propensity of people to use informal saving mechanism such as Merry Go Round‟ but raises the probability of their being banked. The researcher also found that, M-pesa improves individual outcomes by promoting banking and increasing transfers.

Waihenya (2012) conducted a study of the effect of mobile banking on Financial Inclusion in Kenya. Secondary data was used for this study since it is easily accessible, cheaper and accurate for this case due to the regulations around submissions by Central Bank of Kenya. Secondary data from existing theories and researchers done on mobile money transfer and financial

inclusion from finance books, journals, periodicals and internet was also relied upon. The study concluded that agency banking has the effect of increased financial inclusion in the country significantly. The research found that the levels of financial inclusion are low and that there is notable gap not bridged by formal banking framework. It further notes that agency banking is facing a lot of challenges from the increasing mobile penetration in the country and mobile money transactions increasing at the same rate.

Sanz, (2011), a study on improving access to finance through mobile financial services. The purpose of this research initiative was to analyse IF models based on prepaid platforms and cellular technology can address the lack of access to financial services in the vast majority of developing countries. A review of the relevant factors that explain the lack of access to financial services was done between January and March 2011. The study shows that mobile banking is used often because the industry beliefs in future profitability , enabling regulatory change , a dramatic fall in connectivity cost and the creation of cash handling agents using existing networks. The study focused on how Mobile banking has improved financial access.

Munga, (2010), carried out a research on the impact of mobile banking: a case study of M-pesa in the Kenyan society. The purpose of the study was to determine the economic and social impact of mobile banking such as M-Pesa to the society in Kenya. Questionnaires were used to collect primary data which was supplemented with some secondary data from safaricom‟s Annual Reports. Various statistical analysis techniques such as descriptive statistics, difference of means and Chi-Square test were used to measure the social economic impacts M-Pesa has had. The research proved that M-pesa had a big impact on the Kenyans lives both socially and economically.

Njenga, (2009), studied on Mobile Banking: Usage Experiences. He focused on the extent of usage of mobile banking in Kenya. The discussion of his paper was based on an analysis of the mobile phone based banking, performance in terms of outlook and appropriation objectives. The study was informed by survey on M- Banking services and demand. The findings of the research validate the view that the Kenyan mobile sector presents an enormous potential for growth and depending on the nature of activities and requisite levels of expediency users will employ M-banking in various ways.

2.5 Summary of Literature Review

Financial deepening permits the financial process of mobilizing and allocating savings, enables superior allocation of savings through widening and diversifying financial markets wherein investment opportunities compete for savings flow. The savers are offered a wider menu of portfolio choice. The market is broadened in terms of scale, maturity and risk (Shaw, 1973). Information is available more cheaply. Local capital markets are integrated and new avenues for pooling savings and specializing in investments are possible.

The main challenge of financial intermediation is informational asymmetries generated market imperfections. Many of these imperfections lead to specific forms of transaction cost and in many a times increase the cost of doing financial transaction which ultimately hampers financial deepening. Technological innovations are more likely to enable banks to provide a variety of products to customers. The ability of most banks providing affordable and competitive banking services across geographical boundaries largely depends on the technology adopted. Mobile is perhaps the most convenient way of providing a bank account to most people who have no

access to banking facilities. It is also one of the competitive ways of mobilizing deposits and savings from customers.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlights the research methodology used by the researcher in conducting this study. In this chapter, the researcher will discuss the research design employed to conduct the study, the population and sample size of his study in addition to how the researcher arrives at the selected population and sample.

The researcher details on the methods used to collect data and for what period. The researcher presents the analytical model used for data analysis and explains the dependent and independent variables and explains on how each variable will be measured. The researcher concludes the chapter by indicating on how the research findings are presented.

3.2 Research Design

Research design refers to the way the study is designed, that is, the method used to carry out the research. Descriptive research is the investigation in which quantity data will be collected and analyzed in order to describe the specific phenomenon in its current trends, events and linkages between different factors at the current time. It is concerned with finding out the what, where, and how of a phenomenon (Cooper and Pamela, 2008).

This study adopted descriptive survey research of cross sectional type since it is a survey of all commercial banks in Kenya. Tanur (1982) asserts that a survey is a means of collecting information about a large group of elements referred to as a population. A survey has three

characteristics: to produce quantitative descriptions of some aspects of the study population in which case it is concerned either with relationships between variables, or with projecting findings descriptively to a predefined population; data collection is done by asking people structured and predefined questions and data is collected from a fraction of the target population (Pinsonneault and Kraemer, 1992).

3.3 Population and Sampling

The population of the study was commercial banking institutions operating in Kenya. According to Central Bank of Kenya (2013) there were 43 licensed and operational commercial banks as at December 2013. The study period is the years 2004 to 2013, being the period before and after the introduction of mobile money payments.

The study adopted a census study approach and collected macro data from Central Bank of Kenya. A census is feasible when the population is small and necessary when the elements are quite different from each other.

3.4 Data Collection

This study used secondary data from Central Bank of Kenya, Kenya National Bureau of Standards and Communication Authority Kenya. This method of data collection was employed since data was easily accessible, cheaper and very accurate. The CBK guideline on banking statistics requires that all commercial banks must furnish the regulator with the critical industry data. Failure to submit this data on time and accurately attracts administrative penalties, (Waihenya, 2012) There is also strict regulatory watch by the CCK over the mobile money transfer services from registration and anti-money laundering activities hence.

The data was collected from the reports and websites and prepared on excel spread sheets before being uploaded into SPSS program. Quarterly data was collected on mobile money payments subscribers, Central Bank rate, mobile payments deposits, bank deposits, bank loans, GDP and total mobile subscribers.

3.5 Data Analysis

This study sought to establish the relationship between mobile money and the financial deepening in Kenya. In order to achieve this objective, the researcher used regression analysis to establish the relationship by utilizing the SPSS program. The study adopted the following analytical equation in conducting regression analysis.

Y = a + b1 X1 +b2 X2 + b3 X3 + b4X4 + e

Where: **Y** represented Financial Deepening in Kenya which is to be measured through total commercial bank deposits as a percentage of GDP in the last 10 years;

a represented other factors affecting financial deepening.

b1, b2 b3,b4 are slope coefficients whose sign depicted the relationship between the independent and the dependent variables.

X1 represented the number of customers reached through Mobile Banking Technology;

X2 represented the reduction in transaction cost (Interest rates);

X3 represented the deposits that have been mobilized through mobile banking;

X4 represents the amount of loans in the financial sector to the GDP;

e represented the error term.

The selection of the above variables is informed by the main determinant of financial deepening which are bank deposit, bank loans, interest rates and gross domestic product. The inclusion of mobile payment subscribers is to establish whether there is a relationship between the increase in the number of mobile subscribers and financial deepening.

The data analysis techniques included descriptive statistics like the mean, minimum, maximum and standard deviation. In addition, inferential statistics like correlation analysis and regression analysis have used to establish relationships between the dependent and independent variables. The findings were presented by tables.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter covers data analysis in a descriptive and inferential perspective. It gives the various research findings with an explanatory note to the research findings. For the inferential analysis, the study used the Pearson‘s correlation, the panel data regression analysis. It shows the relationship between mobile money payments and financial deepening 2004 to 2013 in terms of number of mobile money subscribers, central bank rate, mobile money deposits and loans disbursed as a percentage of the GDP.

4.2 Descriptive Statistics

Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Financial_Deepening	40	.00	.51	.3777	.10118
M_Payments_CustomersTotal_subscibers	25	.06	.96	.5585	.22875
CBK_Rate	25	6	18	9.33	3.644
Mobile_Banking_depositsTotal_deposits	38	.00	.08	.0307	.03091
Loans_GDP	40	.00	.33	.2470	.06728
Valid N (listwise)	22				

The table above show shows the descriptive statistics of four indicators of financial deepening. The indicators are mobile payment customers, CBK rate, mobile banking deposits and bank loans. The table also shows the mean and standard deviation of each variable. From the table we can observe that, the average level of financial deepening is 37.77 percent. It can also be observed that mobile banking deposits and bank loans have the lowest level of variance.

4.3 Regression Statistics

Multivariate regression analysis was conducted where the total deposits of commercial banks as a percentage of the GDP was the dependent variable and number of customers reached through Mobile Banking Technology as a percentage of the total number of customers; volume of transactions that are handled through mobile banking annually as a percentage of the total number of subscribers and deposits mobilized through mobile payments as to total bank deposits were the dependent variables. The results are presented in table 4.2.

Table 4. 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939[a]	.881	.853	.01126

a. Predictors: (Constant), Loans_GDP, CBK_Rate, M_Payments_CustomersTotal_subscibers, Mobile_Banking_depositsTotal_deposits

The study sought to establish the effect of mobile money payments on financial deepening in Kenya. From the model summary, the four predictors namely mobile money subscribers, Central Bank rate, mobile deposits and total loans were able to explain 88.1% (R^2=.881) of the change in Y (financial deepening as measured by deposits to GDP).

Table 4. 3: Anova Results

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.016	4	.004	31.538	.000[b]
	Residual	.002	17	.000		
	Total	.018	21			

a. Dependent Variable: Financial_Deepening

b. Predictors: (Constant), Loans_GDP, CBK_Rate, M_Payments_CustomersTotal_subscibers, Mobile_Banking_depositsTotal_deposits

The F-ratio shown in the ANOVA table above was found to be statistically significant (F=31.358, p=.000). This means that the model was statistically significant and the relationship

of the variables in the model did not occur by chance. Therefore, the model is significant, adequate and reliable to support any analysis drawn from it.

Table 4. 4: Coefficients Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.107	.037		2.884	.010
	Mobile Payments_Customer	.026	.032	.189	.821	.423
	CBK_Rate	-.002	.001	-.238	-2.515	.022
	Mobile_Banking_deposits	-.322	.352	-.247	-.917	.372
	Loans_	1.159	.180	1.070	6.426	.000

a. Dependent Variable: Financial_Deepening

Results from the above coefficients table showed that 10.7% of financial could not be explained by the independent variables of the model. That is, this level of deepening can only be explained by other factors not captured in the model. The results show that mobile money customers have a positive relationship with financial deepening with a beta coefficient of 0.189 and significance of 0.423. Mobile payment customers are insignificant at 5% level of significance. The Central Bank rate has a negative relationship with financial deepening with a coefficient of negative of 0.238. This relationship is statistically significant at 5% level of significance.

The relationship between mobile deposits and financial deepening is negative with a coefficient of negative 0.247. This relationship is not statistically significant at 5% level of confidence. The results also indicated a positive relationship between bank loans and financial deepening with a coefficient of 1.07. This relationship is statistically significant at 5% level of confidence.

The coefficients table shows the contribution of each variable to the change in Y (financial deepening). Replacing β values in the regression model

$$\mathbf{Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e}$$

$$Y = 0.107 + .189X_1 - .238X_2 - .247X_3 + 1.07X_4 + .01126$$

From the model coefficients above, it is evident that mobile payment customers and bank loans have a positive with financial deepening whereas CBK rate and mobile payments deposits have a negative relationship with financial deepening.

4.4 Discussion

The results show that even without mobile money payments variable financial deepening of up to 10.7 percent occurred. This is especially true considering the fact that not all banks have embraced the use of mobile money in their operations. Mobile money customers have a positive relationship with financial deepening (β=.189, *P*=.423). As the number of mobile money customers' increase, so does financial deepening even though this may not be statistically significant.

The transaction cost as measured using Central Bank Rate has a negative relationship with financial deepening (β= -.238, *P*=.022). This means as transaction cost increases the financial deepening reduces and this relationship was statistically significant. This relationship is in line with the general thinking that increase in transaction cost should lead to reduction in financial deepening.

The results also show that mobile deposits have a negative relationship with financial deepening. This negative relationship is statistically insignificant. (β=-247, *P=.372*). This means as the mobile deposits increase, there is a reduction in financial deepening even though this relationship is statistically insignificant. This may be possibly attributed to a situation where some mobile

money payment customers are not directly connected to the mainstream banks and some mobile deposits may not be considered banking deposits.

The total loans extended as a percentage of the GDP has positive relationship with financial deepening and the relationship is also statistically significant (β= 1.070, *P*=.000). This relationship essentially means that change in the loans advanced statistically influence the level of financial deepening.

The overall average regression results for the five years from 2004 to 2013 indicate that the four independent variables explain financial deepening in Kenya by 88.1% thus mobile payments can positively contribute to financial deepening. However, further research should be done to establish why mobile banking deposits do not positively influence financial deepening.

Table 4.5: Correlations

		Financial_Deepening	M_Payments_CustomersTotal_subsciberse	CBK_Rate	Mobile_Banking_depositsTotal_deposits	Loans_GDP
Pearson Correlation	Financial_Deepening	1.000	.742	.186	.750	.907
	M_Payments_CustomersTotal_subscibers	.742	1.000	.334	.929	.806
	CBK_Rate	.186	.334	1.000	.420	.434
	Mobile_Banking_depositsTotal_deposits	.750	.929	.420	1.000	.861
	Loans_GDP	.907	.806	.434	.861	1.000
Sig. (1-tailed)	Financial_Deepening	.	.000	.204	.000	.000
	M_Payments_CustomersTotal_subscibers	.000	.	.064	.000	.000
	CBK_Rate	.204	.064	.	.026	.022
	Mobile_Banking_depositsTotal_deposits	.000	.000	.026	.	.000
	Loans_GDP	.000	.000	.022	.000	.
N	Financial_Deepening	22	22	22	22	22
	M_Payments_CustomersTotal_subscibers	22	22	22	22	22
	CBK_Rate	22	22	22	22	22
	Mobile_Banking_depositsTotal_deposits	22	22	22	22	22
	Loans_GDP	22	22	22	22	22

When Pearson's correlation is close to 1, there is a strong relationship between the variables and thus changes in one variable correlates with changes in other variables. The results from the above table indicate that mobile payment customers and financial deepening is 0.742 indicating a strong relationship. Mobile customer has a relatively weak correlation with CBK interest rate but strong correlation with mobile deposits and loans.

The Central bank rate has a weak correlation with almost all the variable as the correlations are not closer to 1. Mobile deposits have a strong correlation to all variables except CBK rate. The loans disbursed as a percentage of the GDP has also a positive correlation with all variables except the Central Bank rate. This then generally means, the central bank rate has a weak correlation with the other independent variables and its correlation with financial deepening is not statistically significant.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings on the effect of mobile money payments on financial deepening in Kenya. Presented in the chapter also are the conclusions, recommendations and the suggestions for further research.

5.2 Summary of Findings

The purpose of the study was to establish the effect of mobile money payments on financial deepening in Kenya. The study utilized secondary data. The total deposits of commercial banks as a percentage of the GDP was the dependent variable and number of mobile payment customers, the central bank rate, deposits mobilized through mobile payments and loans disbursed being independent variables.

The findings from the study revealed mobile money subscribers, CBK rate, mobile deposits and loans were to explain 88.1% changes in financial deepening and thus11.9 are explained by other factors not captured in the model. Consequently, mobile money payments have a significant contribution to financial deepening.

The results show that mobile money customers have a positive relationship with financial deepening. Its coefficient indicated that one percentage increase in mobile customers subscribers can lead to 0.189 percent increase in financial deepening, others factors held constant. But this relationship is not statistically significant.

The results indicated a positive relationship between bank loans and financial deepening. The bank loans coefficient is 1.07 meaning a one percentage increase in bank loans cam lead to 1.07 percent increase in financial deepening. This relationship is statistically significant.

The relationship between mobile deposits and financial deepening is negative. The coefficient of mobile deposits is negative .247 implying a one percentage increase in mobile deposits leads to a 0.247 percent decline in financial deepening. This relationship is not statistically significant.

The Central Bank rate has a negative relationship with financial deepening. The CBK rate coefficient is negative 0.238. Thus a one percentage increase in CBK rate leads to a 0.238 percent decline in financial deepening. This relationship is statistically significant.

5.3 Conclusions

Mobile money payments have a positive effect on financial deepening of the in Kenya. Mobile payment users are normally part of the "banked" population. However, the percent of the banked population using mobile payments has increased significantly as new users have opened bank accounts, and as banks started allowing consumers to link their mobile money and bank accounts. Mobile payments represent a huge, growing, and untapped market. If handled correctly it can bring change to the Kenyan economy. Moreover, it has the potential to enhance competition in the banking sector.

5.4 Recommendations

The study has established that mobile money payments have the potential of enhancing the financial deepening in the banking industry. It will be important for banks in Kenya to invest in

technologies that allow for integration of mobile money payments into their systems in order for them to improve product and service provision. The banks have to equally simplify loans processing procedures using mobile phone in order for them to increase loan uptake by mobile money customers in addition to ensuring they reduce transaction costs and small transaction are completed inexpensively. Also the government has that ensures the service providers have put in place proper security measures to protect clients' money and data.

5.5 Limitations of the study

The study was based on the secondary data mainly collected from Central Bank of Kenya, Kenya National Bureau of Statistics and Communications Authority of Kenya for the period between 2004 – 2013. Mobile money payments were introduced in Kenya in the year 2007 and therefore there is no data for years 2004 to 2007.

The format of presenting data changed a lot over the years and there were challenges of verifying the accuracy of some data. This implies that if there were any material errors or misrepresentation of facts in the information collected from the reports and websites, then the findings of this study could also be limited by those errors and misrepresentations.

The financial industry in Kenya is very competitive and any information that gives an institution a competitive advantage over the other is kept a top secret. Most banks declined data on mobile payments even after assurance of confidentiality. This led the researcher to use macro data from Central Bank because even Central bank could not disclose every banks data.

Central Bank of Kenya has a number of departments which operate quite independently. Some of the data the researcher required cuts across some departments. Issues of bureaucracy arose at Central bank of Kenya and this made the data collection take long.

The study relied on GDP data at market prices and not the real GDP collected from the Kenya National Bureau of Statistics. Further, with the rebasing of the Kenyan GDP, the data relied on the rebased GDP data as collected from the Kenya national Bureau of statistics. Use of real GDP and non-rebased GDP generate different results.

5.6 Suggestions for Further Research

Mobile money payments have a positive relationship with financial deepening. However, the study recommends further research to establish why mobile money deposits have a negative relationship with financial deepening even when the deposits have been increasing over the years.

Some banks have started offering their own mobile payments and this is likely to have changes on financial deepening. The study also recommends further research on the impact of mobile payments offered by banks on financial deepening in Kenya.

Mobile money payments are regulated by both Communications Authority of Kenya and Central Bank of Kenya. This presents regulatory challenges especially in era of increased competition and innovation. The study recommends further research on the regulatory challenges of mobile payments in Kenya.

Mobile payments have the ability to increase the deposits of commercial banks in addition to enhancing the credit history of the borrowers. This will ideally make it easy for borrowers to

have access to credit through the mobile phones. Further research need to be done on the factors limiting access to credit via mobile phones.

This study utilized secondary quantitative data collected mainly from the regulatory authorities. Further research can be done on the qualitative mobile payments factors that affect financial deepening and such information can be collected from the users of mobile payments services.

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APPENDICES

Appendix I: Research Data

Year	Financial Deepening(Bank deposits/GDP)	M Payments Customers/Total subscibers	CBK Rate	Mobile Banking deposits/Total deposits	Loans /GDP
Mar-04	0.44			-	0.26
Jun-04	0.45			-	0.28
Sep-04	0.47			-	0.29
Dec-04	0.48			-	0.32
Mar-05	0.48			-	0.31
Jun-05	0.48			-	0.31
Sep-05	0.49			-	0.32
Dec-05	0.51			-	0.33
Mar-06	0.34			-	0.21
Jun-06	0.33		9.75	-	0.22
Sep-06	0.34			-	0.22
Dec-06	0.37			-	0.23
Mar-07	0.33			0.00	0.21
Jun-07	0.33			0.00	0.20
Sep-07	0.34	0.06	8.5	0.00	0.21
Dec-07	0.37	0.12		0.00	0.23
Mar-08	0.33			0.01	0.21
Jun-08	0.36	0.23	9	0.01	0.22
Sep-08	0.36	0.29	9	0.02	0.24
Dec-08	0.38	0.32	8.5	0.03	0.25
Mar-09	0.34	0.37	8.25	0.04	0.22
Jun-09	0.35	0.41	7.75	0.04	0.23
Sep-09	0.36	0.45	7.75	0.04	0.23
Dec-09	0.38	0.46	7	0.05	0.25
Mar-10	0.37	0.50	6.75	0.05	0.24
Jun-10	0.40	0.54	6	0.05	0.25
Sep-10	0.42	0.68	6.75	0.05	0.26
Dec-10	0.43	0.66	6	0.06	0.28
Mar-11	0.39	0.69	6	0.06	0.25
Jun-11	0.40	0.72	6.25	0.06	0.28
Sep-11	0.43	0.71	7	0.07	0.30
Dec-11	0.43	0.68	18	0.07	0.31
Mar-12	0.38	0.67	18	0.08	0.27
Jun-12	0.39	0.96	18	0.07	0.28
Sep-12	0.42	0.65	13	0.07	0.29

Dec-12	0.43	0.69	11	0.08	0.30
Mar-13	0.39	0.75	9.5	0.07	0.27
Jun-13	0.41	0.78	8.5	0.08	0.28
Sep-13	0.00	0.77	8.5		0.00
Dec-13	0.00	0.81	8.5		0.00

Year	Mobile Money Customers	CBK Rate	Mobile Banking deposits	Total Loans (Kshs mn)	Total Bank Deposits	Annual GDP	Total Mobile subscribers
Mar-04	-		-	293,321.00	492,662.00	1,109,338.00	-
Jun-04	-		-	306,641.00	501,504.00	1,109,338.00	-
Sep-04	-		-	324,922.00	518,091.00	1,109,338.00	-
Dec-04	-		-	352,479.00	537,141.00	1,109,338.00	-
Mar-05	-		-	360,178.00	566,040.00	1,172,784.00	-
Jun-05	-		-	365,626.00	562,070.00	1,172,784.00	-
Sep-05	-		-	372,954.00	578,392.00	1,172,784.00	-
Dec-05	-		-	383,736.00	594,671.00	1,172,784.00	-
Mar-06	-		-	399,695.00	630,983.00	1,862,041.00	-
Jun-06	-	9.75	-	413,588.00	608,586.00	1,862,041.00	-
Sep-06	-		-	416,132.00	639,659.00	1,862,041.00	-
Dec-06	-		-	431,014.00	681,098.00	1,862,041.00	-
Mar-07	20,992.00		64.39	450,157.00	710,128.00	2,151,350.00	-
Jun-07	175,652.00		720.10	434,927.00	713,467.00	2,151,350.00	-
Sep-07	635,761.00	8.5	2,069.69	456,847.00	734,485.00	2,151,350.00	10,777,102.00
Dec-07	1,345,270.00		3,770.27	500,713.00	797,237.00	2,151,350.00	11,412,412.00
Mar-08	2,075,530.00		6,747.45	513,544.00	816,833.00	2,483,058.00	
Jun-08	3,038,520.00	9	10,917.20	554,315.00	888,354.00	2,483,058.00	12,933,653.00

Sep-08	4,143,040.00	9	19,269.90	603,657.00	905,587.00	2,483,058.00	14,503,964.00
Dec-08	5,082,470.00	8.5	26,990.00	630,817.00	934,197.00	2,483,058.00	16,027,854.00
Mar-09	6,289,520.00	8.25	33,820.20	640,620.00	961,076.00	2,863,688.00	17,094,902.00
Jun-09	7,190,620.00	7.75	38,175.60	659,326.00	1,015,631.00	2,863,688.00	17,372,357.00
Sep-09	8,016,240.00	7.75	45,368.30	667,901.00	1,042,899.00	2,863,688.00	17,758,103.00
Dec-09	8,882,580.00	7	52,341.70	714,189.00	1,074,617.00	2,863,688.00	19,178,185.00
Mar-10	9,922,110.00	6.75	56,116.70	749,593.00	1,184,500.00	3,169,335.00	19,885,258.00
Jun-10	10,914,700.00	6	58,099.30	789,269.00	1,262,588.00	3,169,335.00	20,119,304.00
Sep-10	15,223,900.00	6.75	68,506.20	830,754.00	1,322,357.00	3,169,335.00	22,318,610.00
Dec-10	16,446,300.00	6	75,865.40	875,547.00	1,374,460.00	3,169,335.00	24,968,891.00
Mar-11	17,465,300.00	6	88,996.60	940,811.00	1,440,731.00	3,726,052.00	25,220,702.00
Jun-11	18,146,900.00	6.25	92,643.70	1,027,445.00	1,487,221.00	3,726,052.00	25,279,768.00
Sep-11	18,891,600.00	7	108,615.00	1,129,836.00	1,588,954.00	3,726,052.00	26,493,940.00
Dec-11	19,191,000.00	18	118,080.00	1,141,706.00	1,602,573.00	3,726,052.00	28,080,771.00
Mar-12	19,694,300.00	18	126,093.00	1,160,925.00	1,634,195.00	4,254,772.00	29,211,649.00
Jun-12	19,795,600.00	18	124,020.00	1,193,941.00	1,678,861.00	4,254,772.00	20,703,439.00
Sep-12	19,710,000.00	13	130,690.00	1,217,278.00	1,773,577.00	4,254,772.00	30,432,782.00
Dec-12	21,060,000.00	11	150,160.00	1,262,088.00	1,834,549.00	4,254,772.00	30,731,154.00
Mar-13	22,329,200.00	9.5	134,446.00	1,292,049.00	1,857,658.00	4,757,532.00	29,849,336.00
Jun-13	23,750,000.00	8.5	152,500.00	1,342,919.00	1,944,801.00	4,757,532.00	30,549,422.00
Sep-13	23,970,000.00	8.5	165,590.00			4,757,532.00	31,301,506.00
Dec-13	25,326,300.00	8.5	182,495.00			4,757,532.00	31,309,017.00

Source (Author)

Appendix II: SPSS Data Analysis Output

DESCRIPTIVES VARIABLES=Financial_Deepening
M_Payments_CustomersTotal_subscibers CBK_Rate Mobile_Banking_depositsTotal_deposits
Loans_GDP
/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Notes		
Output Created		20-OCT-2014 12:09:05
Comments		
Input	Data	C:\Users\Denis-Ochenge\Desktop\desktop docs\LIT REVIEW\Literature 1\SPSS research data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	40
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=Financial_Deepening M_Payments_CustomersTotal_subscibers CBK_Rate Mobile_Banking_depositsTotal_deposits Loans_GDP /STATISTICS=MEAN STDDEV MIN MAX.
`Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

[DataSet1] C:\Users\Denis-Ochenge\Desktop\desktop docs\LIT REVIEW\Literature 1\SPSS research data.sav

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Financial_Deepening	40	.00	.51	.3777	.10118
M_Payments_CustomersTotal_subscibers	25	.06	.96	.5585	.22875
CBK_Rate	25	6	18	9.33	3.644
Mobile_Banking_depositsTotal_deposits	38	.00	.08	.0307	.03091
Loans_GDP	40	.00	.33	.2470	.06728
Valid N (listwise)	22				

```
REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Financial_Deepening
  /METHOD=ENTER M_Payments_CustomersTotal_subscibers CBK_Rate
Mobile_Banking_depositsTotal_deposits Loans_GDP
  /PARTIALPLOT ALL
  /RESIDUALS HISTOGRAM(ZRESID).
```

Regression

Notes		
Output Created		20-OCT-2014 12:37:21
Comments		
Input	Data	C:\Users\Denis-Ochenge\Desktop\desktop docs\LIT REVIEW\Literature 1\SPSS research data.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	40
Missing Value Handling	Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on cases with no missing values for any variable used.
Syntax		REGRESSION /DESCRIPTIVES MEAN STDDEV CORR SIG N /MISSING LISTWISE /STATISTICS COEFF OUTS R ANOVA ZPP /CRITERIA=PIN(.05) POUT(.10) /NOORIGIN /DEPENDENT Financial_Deepening /METHOD=ENTER M_Payments_CustomersTotal_subscibers CBK_Rate Mobile_Banking_depositsTotal_deposits Loans_GDP /PARTIALPLOT ALL /RESIDUALS HISTOGRAM(ZRESID).
Resources	Processor Time	00:00:00.66

Resources	Elapsed Time	00:00:00.61
	Memory Required	2324 bytes
	Additional Memory Required for Residual Plots	1928 bytes

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939[a]	.881	.853	.01126

a. Predictors: (Constant), Loans_GDP, CBK_Rate, M_Payments_CustomersTotal_subscibers, Mobile_Banking_depositsTotal_deposits

b. Dependent Variable: Financial_Deepening

ANOVA[a]

Model	Sum of Squares	Df	Mean Square	F	Sig.

Correlations

		Financial_Deepening	Mobile_Payments_Customers	CBK_Rate	Mobile_Banking_deposits	Loans_
Pearson Correlation	Financial_Deepening	1.000	.742	.186	.750	.907
	M_Payments_Customers	.742	1.000	.334	.929	.806
	CBK_Rate	.186	.334	1.000	.420	.434
	Mobile_Banking_deposits	.750	.929	.420	1.000	.861
	Loans_GDP	.907	.806	.434	.861	1.000
Sig. (1-tailed)	Financial_Deepening	.	.000	.204	.000	.000
	M_Payments_Customers	.000	.	.064	.000	.000
	CBK_Rate	.204	.064	.	.026	.022
	Mobile_Banking_deposits	.000	.000	.026	.	.000
	Loans_GDP	.000	.000	.022	.000	.
N	Financial_Deepening	22	22	22	22	22
	M_Payments_Customers	22	22	22	22	22
	CBK_Rate	22	22	22	22	22
	Mobile_Banking_deposits	22	22	22	22	22
	Loans_GDP	22	22	22	22	22

1	Regression	.016	4	.004	31.538	.000[b]
	Residual	.002	17	.000		
	Total	.018	21			

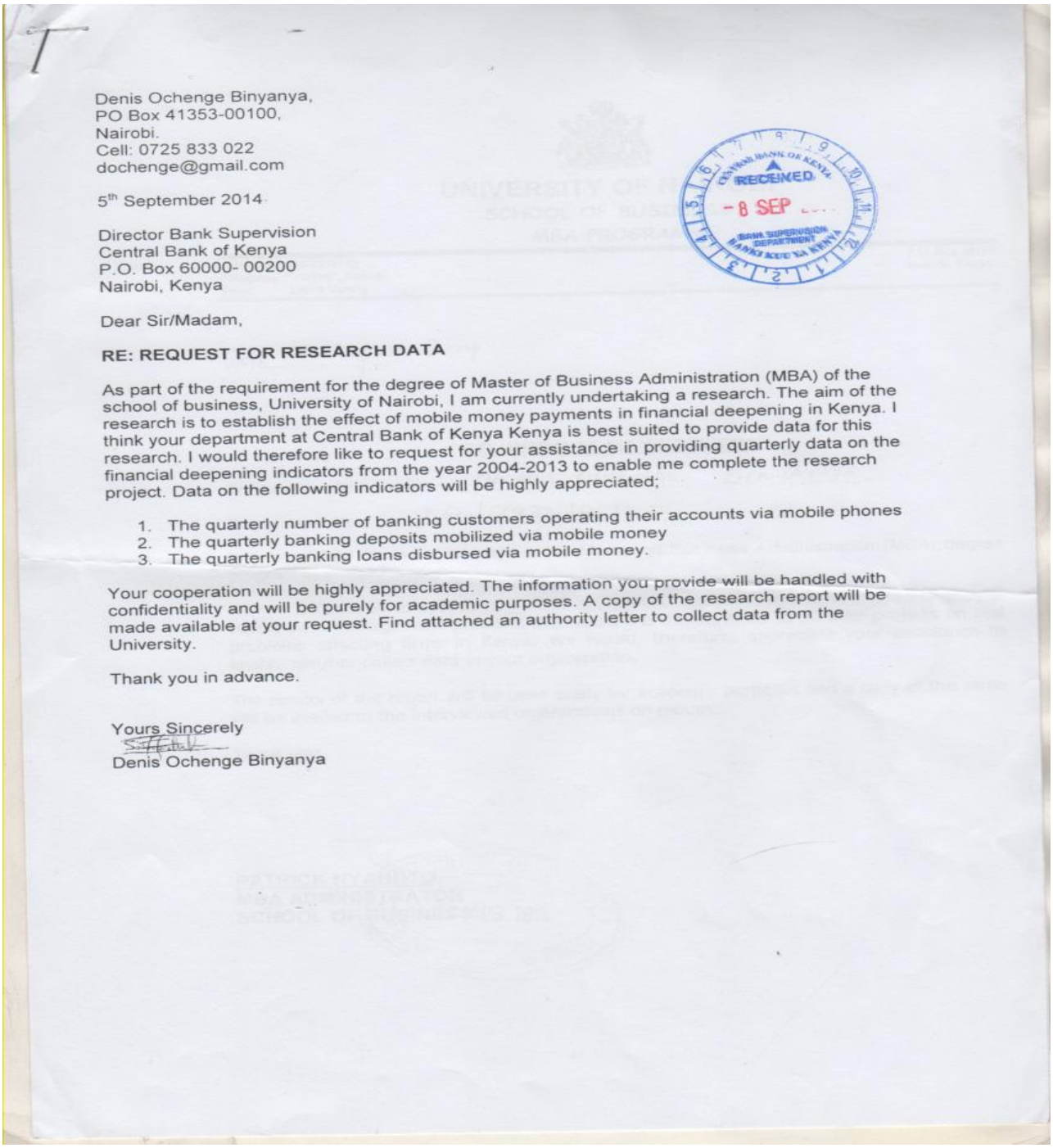
a. Dependent Variable: Financial_Deepening

b. Predictors: (Constant), Loans_GDP, CBK_Rate, M_Payments_CustomersTotal_subscibers, Mobile_Banking_depositsTotal_deposits

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.107	.037		2.884	.010
	M_Payments_Customers Total_subscibers	.026	.032	.189	.821	.423
	CBK_Rate	-.002	.001	-.238	-2.515	.022
	Mobile_Banking_deposit sTotal_deposits	-.322	.352	-.247	-.917	.372
	Loans_GDP	1.159	.180	1.070	6.426	.000

a. Dependent Variable: Financial_Deepening

Appendix III: letter requesting for data



Denis Ochenge Binyanya,
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dochenge@gmail.com

5th September 2014

Director Bank Supervision
Central Bank of Kenya
P.O. Box 60000- 00200
Nairobi, Kenya

CENTRAL BANK OF KENYA
RECEIVED
- 8 SEP
BANK SUPERVISION DEPARTMENT

Dear Sir/Madam,

RE: REQUEST FOR RESEARCH DATA

As part of the requirement for the degree of Master of Business Administration (MBA) of the school of business, University of Nairobi, I am currently undertaking a research. The aim of the research is to establish the effect of mobile money payments in financial deepening in Kenya. I think your department at Central Bank of Kenya Kenya is best suited to provide data for this research. I would therefore like to request for your assistance in providing quarterly data on the financial deepening indicators from the year 2004-2013 to enable me complete the research project. Data on the following indicators will be highly appreciated;

1. The quarterly number of banking customers operating their accounts via mobile phones
2. The quarterly banking deposits mobilized via mobile money
3. The quarterly banking loans disbursed via mobile money.

Your cooperation will be highly appreciated. The information you provide will be handled with confidentiality and will be purely for academic purposes. A copy of the research report will be made available at your request. Find attached an authority letter to collect data from the University.

Thank you in advance.

Yours Sincerely

Denis Ochenge Binyanya